

Aspects of Coronal Mass Ejections Related to Space Weather

Nat Gopalswamy

Solar cycle 23 witnessed an unprecedented array of space- and ground-based instruments observing the violent eruptions from the Sun that had huge impact on the heliosphere. It was possible to characterize coronal mass ejections (CMEs) that cause extreme solar energetic particle events and geomagnetic storms, the two aspects that concern the space weather community. In this paper I discuss the special populations of CMEs that have significant interplanetary consequences: shock-driving CMEs identified based on their association with type II radio bursts and in-situ shocks, SEP-producing CMEs, and geoeffective CMEs (those that produce geomagnetic storms). I discuss the kinematic and solar-source properties of these populations and how they vary with the solar activity cycle. I also compare their properties with the general population of CMEs, so one can recognize when and where these events occur on the Sun.